THE JOSEPH REED SHELL RING

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Introduction

The Joseph Reed Shell Ring (8MT13) is a semi-circular piling of oyster shell rising up to 2 meters in height. The site is surrounded by mangrove swamp on all sides except the east where it abuts an Atlantic Ocean beach dune (Figure 1[1]). The site was first recorded in 1965 by William Sears and Charles Hoffman in the University of Florida Archaeology Laboratory (UFAL) files (Ryan Wheeler, personal communication; see also Sears and Hoffman 1965 as cited in Carr et al. 1995:54-55). It was listed in the Florida Master Site File (FMSF) in 1979 as the Joseph Reed Mound, but we refer to it in this paper as the Joseph Reed Shell Ring. In 1966, Wm. Jerald Kennedy completed a contour map, apparently with the help of Sears (Carr et al. 1995:54). This was later published in Fryman et al. (1980) who suggested a number of possible functions for the unusually shaped site, including Sears' opinion that the site was similar to the famous shell rings known in Georgia and South Carolina (Fryman et al.1980:20, 41). Alternatively, they suggested the ring might be related to the prehistoric Belle Glade circular earthworks commonly found in the nearby Everglades and dating between 2800 and 1200 B.P. Or, based on local oral accounts, it may have been an historic construction – a dike used to prevent flooding of an orange grove in the interior of the ring (Fryman et al. 1980:41).

Our limited investigation of the site was preceded by only one reported investigation conducted in 1979. In that investigation, a shallow test unit was placed in mounded shell to a depth of 30 cm where a "heavy degree of compaction" halted the investigation. The test yielded "oyster and clam shell and one St. Johns Plain sherd" (Fryman et al. 1980:40). Much later, Kennedy and Wheeler (1998:2) state that Sears, at some unspecified time, had collected from the surface three other St. Johns and one sand-tempered plain sherd from the site. Carr et al. (1995:54) confirm that St. Johns sherds were indeed collected by Sears (Sears and Hoffman 1965). At one point Fryman et al. (1980) characterized the site's total assemblage as containing not the one sherd they found, but a "few potsherds" indicating, perhaps, that the authors were also aware of Sears' earlier collection, notes of which were then available at the Florida Master Site File (Ryan Wheeler, personal communication). In either case, the report concludes that "pottery is very scarce" at the site (Fryman et al. 1980:41, 46). Carr et al. (1995) found no ceramics or other artifacts on the surface of the site, although no systematic, intensive investigation was conducted.

Ultimately, Fryman et al. (1980) characterized the site as a shell ring of a diameter typical of those found in South Carolina and Georgia (but more "steep sided"). In actuality, it is four times the size of the average, and nearly three times the diameter of the largest of the Georgia/South Carolina rings (Figure 2). In fact, based on the Kennedy (in Fryman et al. 1980) contour map, the site appears to be, at least in interior diameter, the largest shell ring in North America. What is unusual about the ring is its ceramics. Most Florida Late Archaic ceramic-bearing shell rings contain exclusively fiber-tempered pottery, not Glades or St. Johns pottery – types found typically in more recent prehistoric contexts in South and Northeast Florida, respectively. This brings into question the site's cultural affiliation. Carr et al. (1995:55) have suggested that the few St. Johns ceramics found on the surface and near surface environments, as well as the fact that the site is a shell ring, relates it to the Orange culture of Northeast Florida. But recently shell rings have also been found in South Florida (Dickel 1992; Houck 1996; Russo1991; Russo and Heide 2001). Whether in Northeast or South Florida, however, no other ring has yielded either Glades or St. Johns pottery from undisturbed contexts.

1999 Excavations at the Joseph Reed Shell Ring

Four 1 x 1 meter excavation units were placed at the ring site. Two were placed on the southern arm of the half circle, one on the northern arm, and one in the non-shell midden central area. Except the first meter of Unit 2 which was dug in arbitrary 10 cm levels and Unit 3 which was dug in natural levels, all unit proveniences were dug in arbitrary 20 cm levels. All midden was dry screened through ¼" mesh , artifacts were collected from the screens, and fauna was discarded except as noted below. One small feature sample was screened through 1/16" mesh and is described below (see Russo and Heide 2000 for a full description of methodology).

Excavation Unit 1

A thin layer of humus overlies the dense oyster midden that constitutes the upper levels of the ring in Unit 1. The underlying midden consists of dense oyster, which extends from the surface (at approximately 2 meters above mean sea level) to 90 cmbd (Figure 3). It is a single deposit of shell distinguished into two zones, 1 and 2, only by slight differences in pedogenically colored thin soil matrices. In other words, Zones 1 and 2 represent visually indistinguishable cultural

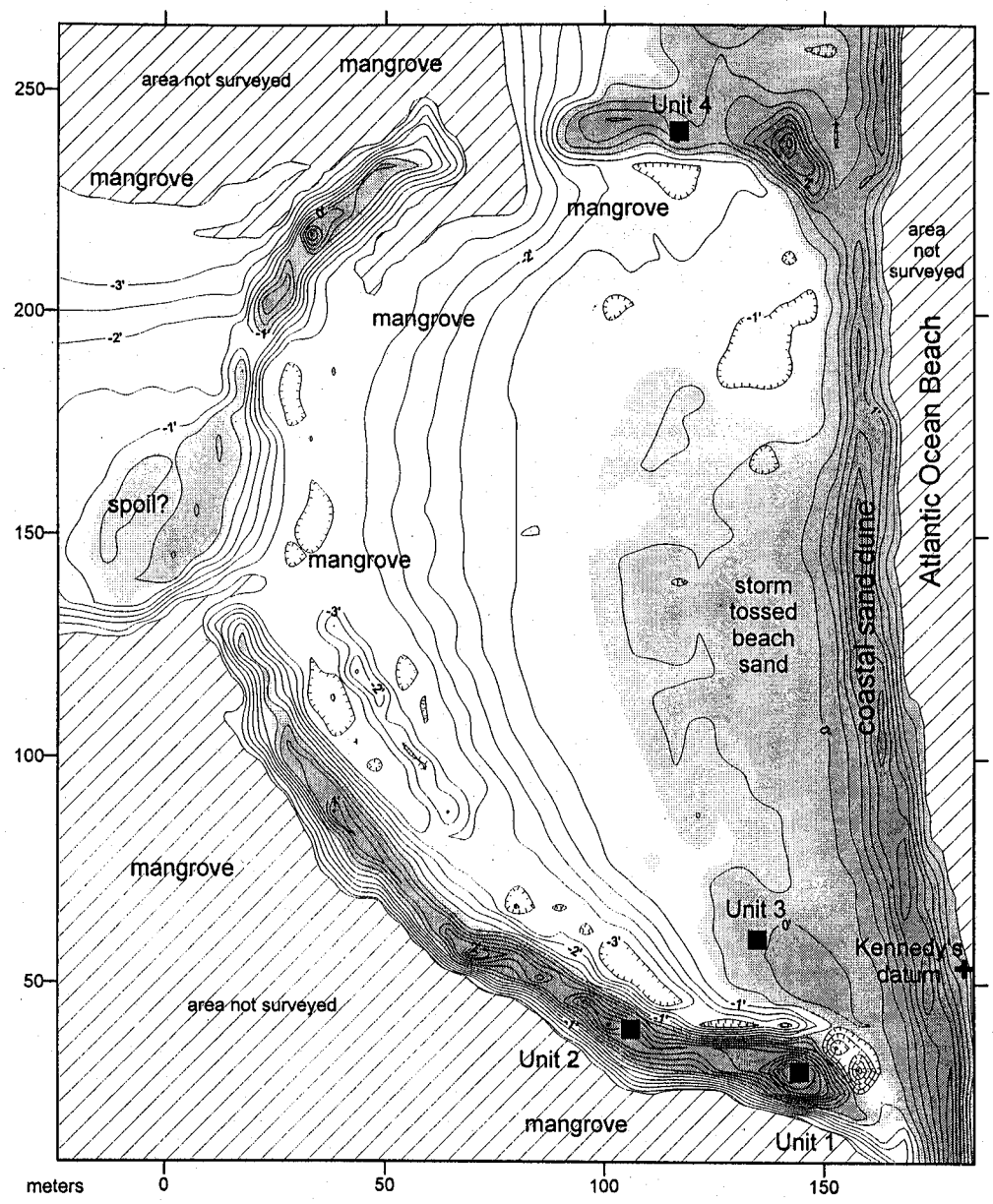

Figure 1. The Joseph Reed Shell Ring (after Kennedy 1966, in Fryman et al. 1980).

deposits, possibly a single deposit of shell.

Below Zone 2 is a 15 cm thick strata of white sand (Zone 3). It is unclear whether this deposit is natural (i.e., aeolian or wave deposited) or of human origin, but it contains no midden material. Below it lies Zone 4 (Feature 1 and 1a), a dark layer of sand filled with scattered charcoal and dense oyster shell. Initially this was identified in the field as a feature because it appeared in plan view as a dark streak against the white sand background (Russo and Heide 2000). Upon further excavation the charcoal laden soil spread across the entire unit. Consequently, it more accurately is described as a stratum or horizon, perhaps a living floor, whose sand is stained dark by charcoal and other discarded organic matter.

Below this midden floor lies Zone 5, another deposit of clean (free of artifacts and shell), white sand between 5 and 25 cm thick similar to Zone 3. Below Zone 5 lies Feature 2 which consists of charcoal impregnated sands. Near the south and west walls of the unit, a small pit feature (Feature 3) was contiguous with, but distinguishable from Feature 2 by the inclusion of greater amounts of oyster shell. Both features were lithified within a calcium carbonate matrix formed from dissolved shell (cf. Palmer and Williams 1977; Russo and Heide 2000; cf. Iceland 2000a). We identified only the edges of these features. The remaining portions lay outside the unit as indicated in the wall profiles. Thus, the complete shapes and functions of the two features remain unknown. We interpret their surfaces to be an activity floor similar to Zone 4.

Table 1. Radiocarbon dates from Joseph Reed Shell Ring, early non-fiber-tempered ceramic bearing sites, and other sites mentioned in the text.

Provenience	Lab Number	Material	Un-corrected Age BP	Conven-tional Age	^{13}C	Maximum of Calibrated Age Ranges B.P. : (intercept) 1 sigma [2 sigma]	Associated Ceramics[a]	Radiocarbon/ Archaeological Reference
Joseph Reed Shell Ring (8Mt13)								
Unit 1, Feature 2	GX-26118	charcoal	2880+/-130	2850+/-130	-26.6‰	[3354] 3206 (2951) 2784 [2746]	above 1 spiculate	
Unit 1, Feature 3	WK 7435	oyster	2868+/-58	3280+/-60	-0.2‰	[3306] 3208 (3131) 3022 [2933]	1 spiculate	
Unit 1, 80-190 cmbd	GX 25976	oyster	3060+/-80	3455+/-80	-0.6‰	[3527] 3426 (3340) 3245 [3139]	none	
Unit 2, 48 cmbd	GX 25977	oyster	3010+/-75	3425+/-75	+0.3‰	[3464] 3379 (3318) 3210 [3103]	4 spiculate	
Unit 2, 155 cmbd	WK 7436	oyster	2935+/-55	3340+/-60	-0.6‰	[3351] 3298 (3205) 3116 [3014]	3 spiculate	
Unit 4, 0-20 cmbd	GX 26119	oyster	2880+/-80	3280+/-80	-0.7‰	[3335] 3232 (3131) 2989 [2875]	above spiculate & s-t	
J-5 (8Ja5)								
Zone 9	M-394	charcoal	3150+/-250	[b]3150+/-253	–25‰	[3979] 3679 (3375, 3369, 3363) 2999 [2754]	18 S.J.; 186 Orange	Bullen 1958:341
Mulberry Midden (8Cr697)								
EU1, Level 2	Beta 50711	*mercenaria*	2990+/-70	[c]3391+/-70	0.0 ‰	[3428] 3349 (3264) 3179 [3068]	s-t plain	Lee et al. 1993
EU1, Level 2	Beta 53141	*busycon*	3000+/-80	3430+/-80	+0.55‰	[3472] 3387 (3321) 3210 [3095]	s-t plain	Lee et al. 1993
Caxambas Point (8Cr107x1)								
T3/S109, 60-80cmbd	I-4573	charcoal	3400+/-100	[b]3400+/-108	–25‰	[3957] 3827 (3675, 3673, 3638) 3476 [3386]	s-t plain	Buckley & Willis 1972
T2/S100, 60-80cmbd	I-4569	charcoal	3155+/-100	[b]3155+/-108	–25‰	[3633] 3471(3376) 3265 [3078]	s-t & Orange	Buckley & Willis 1972
T3/S109, 20-40cmbd	I-4571	charcoal	3375+/-105	[b]3375+/-112	–25‰	[3893] 3814 (3633, 3615, 3613, 3594, 3594) 3471 [3364]	s-t & Orange	Buckley & Willis 1972
Palmer/Hill Cottage Midden (8So2)								
Test A, 2-2.5' bd	G-597	*mercenaria*	3225+/-120	[c]3626+/-120	0.0 ‰	[3832] 3677 (3533) 3379 [3256]	s-t, S.J. & Orange	Bullen & Bullen 1976
Test A, 1' bd	G-596	*busycon*	3350+/-120	[c]3751+/-120	0.0 ‰	[3987] 3834 (3678) 3539 [3382]	s-t, S.J. & Orange	Bullen & Bullen 1976
Ft. Center (8GI13)								
M.B. 3820L490, L-5	I-3556	charcoal	2400+/-105	[b]2400+/-105	–25‰	[2794] 2711 (2357) 2338 [2154]	23 S.J., s-t, sf-t plain	Sears 1982
MAR 8 (8Cr112)								
80 cmbs	I-6550	charcoal	4965+/-100	[b]4965+/-108	[b]–25‰	[5927] 5888 (5660) 5596 [5475]	S.J., Perico, Orange	Widmer 1974
Mt. Elizabeth (8Mt30)								
TU-A, Level 11	Beta-11651	*busycon*		[d]3950+/-70	0.0‰	[4141] 4059 (3928) 3837 [3729]	no ceramics	Janus 1998
TU-A, Level 3	Beta-11650	*mercenaria*		[d]3970+/-50	0.0‰	[4124] 4060 (3965) 3886 [3824]	1 Orange	Janus 1998
Scheurich Midden (8PB9261)								
Level 9	Beta-141466	shell	3370+/-60	[c]3771+/-60	0.0‰	[3869] 3809 (3692) 3627 [3551]	no ceramics	

[a]S.J. = St. Johns; s-t = sand-tempered; sf-t = semi-fiber-tempered

[b]It is unclear if the reported age is uncorrected or corrected. For the purposes of this report, the reported age was treated as uncorrected and normalized for ^{13}C at -25‰ for charcoal samples resulting in the same age for uncorrected and conventional ages, but often slightly different sigma. The conventional ages were then calibrated.

[c]The date was obtained from shell and was reported as uncorrected or is assumed for this paper to be an uncorrected date. ^{13}C was assumed to be 0.0‰ +/-0 and normalized to -25‰ to obtain conventional age. This process and calibration was conducted through Calib 4.3 (Stuiver and Reimer 1993).

[d]The age was reported as conventional; i.e., no uncorrected date given.

All calibrated ages were determined with Calib 4.3 (Stuiver and Reimer 1993) whose calibration data is found in Stuiver, Reimer and Braziunas 1998 and Stuiver et al. 1998.

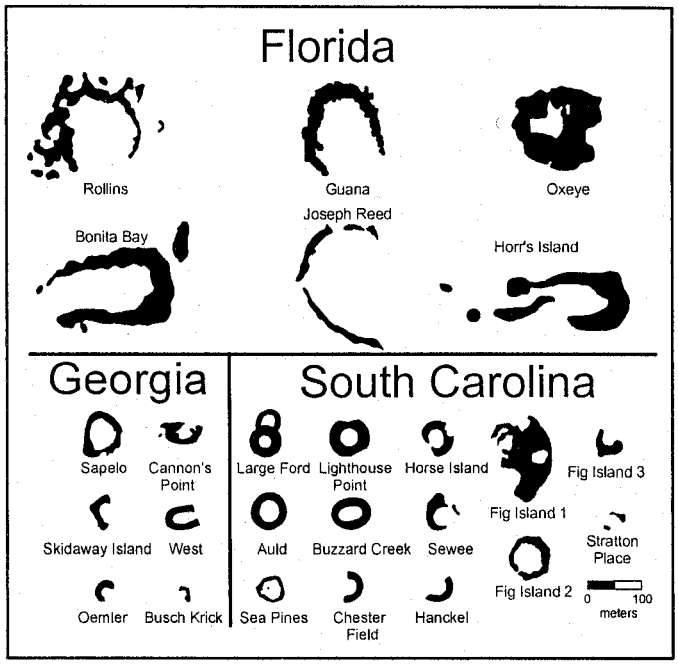

Figure 2. Florida, Georgia, and South Carolina Archaic shell rings.

Below these features lies another deposit of white sand, Zone 6, interrupted only by two small oyster midden deposits (Features 4 and 5) in between 115 and 140 cmbd, both of which lay partially outside the unit. Due to time constraints, excavation of the unit was terminated at 150 cmbd. However, a posthole test was placed in the southeast corner of the unit and dug to 200 cmbd. Another deposit of dense oyster and calcium carbonate (Zone 7) was encountered at 190 cmbd, but its bottom was not reached.

A ^{13}C adjusted (conventional) radiocarbon age of 3455 +/- 80 B.P.[2] (3340 cal B.P.) was obtained from the lowest shell-containing strata, the aceramic Zone 7. Whether ceramics are actually absent from Zone 7 (Figure 3) or the sample was too small to assure representative artifact recovery cannot be determined.[3] Conventional dates were obtained from adjacent Feature 3 (3280 +/-60 B.P.) and Feature 2 (2850 +/-130 B.P.) some 60 cm above Zone 7 (Table 1). The Feature 2 age is based on charcoal, and Feature 3 is based on shell making their dates most comparable with calibration. When calibrated, the two ages overlap between 3022 and 3206 cal B.P. at one sigma (Table 1) and could be contemporaneous.

Few artifacts were recovered from the unit – one unworked piece of sandstone, twenty-five pottery sherds, and three small lithic flakes. The sandstone and twenty-three of the potsherds were from the upper oyster midden, Zone 2 (Figure 3). One sherd was recovered from the living floor (Zone 4) and another from Feature 3. All artifacts were recovered from shell-bearing strata. No sherds or other artifacts were recovered from the sand zones (3, 5 and 6). Chalky plain wares were found stratigraphically lower than sand-tempered wares.

The three small lithic flakes were recovered from a 1/16" screened sample of Feature 3. All three are small pressure flakes, one of which has been thermally altered. Along with oyster shell and vertebrate bone remains, numerous calcium carbonate fragments and thermally fused sand particles identified as fulgurites were also present in the feature (Russo and Heide 2000).

Excavation Unit 2

Unit 2 was placed 40 meters northwest of Unit 1 on top of a high point in the shell ring approximately 2 meters above sea level (Figure 1). The unit was excavated to 180 cmbd with a smaller posthole test placed in the southeast corner to 240 cmbd (Figure 4). Observable midden strata (consisting mostly of dense oyster) are indicated by slight differences in the color and amount of soil mixed with the shell. These differences in Zones 1 and 2 were likely produced pedogenically rather than culturally. That is, Zones 1 and 2 represent visually indistinguishable deposits of oyster shell with lesser amounts of soil in the lower zone likely due to reduced migration with depth from the surface. The source of the soil matrix in Zone 3, on the other hand, likely comes from the sterile sand of Zone 4 below it and upon which the shell was placed. Difference in soil color among all the zones is minimal and is not likely the result of cultural activities. While conventional radiocarbon dates from Zones 2 and 3 appear out of sequence, when calibrated, they overlap at one sigma (3210-3298 cal. B.P.), suggesting the oyster from both levels could have been deposited close in time (Table 1).

Thirty-five potsherds were recovered from Unit 2. As in Unit 1, all are either chalky or sand-tempered plain with the chalky wares being stratigraphically lower. A large secondary flake was recovered from Zone 2. The flake is agatized coral whose nearest possible quarry sources lie between Tampa Bay and Tallahassee (Iceland 2000b) indicating a non-local origin for the artifact. The flake is gray to black in color, is 5.4 cm long, 3.4 cm wide and 0.9 cm thick, has attached cortex, and, based on its waxy appearance, was likely heat treated. No evidence of wear on the platform or use wear is present. Iceland (2000b) believes it was struck from a biface.

Two fragments of bone pin were recovered from Unit 2 (120-140 cmbd), a tip and a base. The base is slightly expanded. Remnants of a vascular groove are still apparent confirming that the base fragment was made from a metapodial of a whitetail deer (*Odocoileus virginianus*). The color of the pin fragments and the congruities in the cracks in the bone suggest that the two fragments may be parts of the same pin. However, they could not be joined (Figure 5).

Excavation Unit 3

Unit 3 was placed about 40 meters north of Unit 1, off the shell ring in the relatively flat interior (Figure 1). According to Kennedy's 1966 contour map, the unit was placed in an area at or below sea level. However, based on our observations, the unit seems to lie a meter or so above high tide, behind a coastal sand dune, and is inundated only during storm surges.

The unit was dug to a depth of 150 cmbd whereupon a

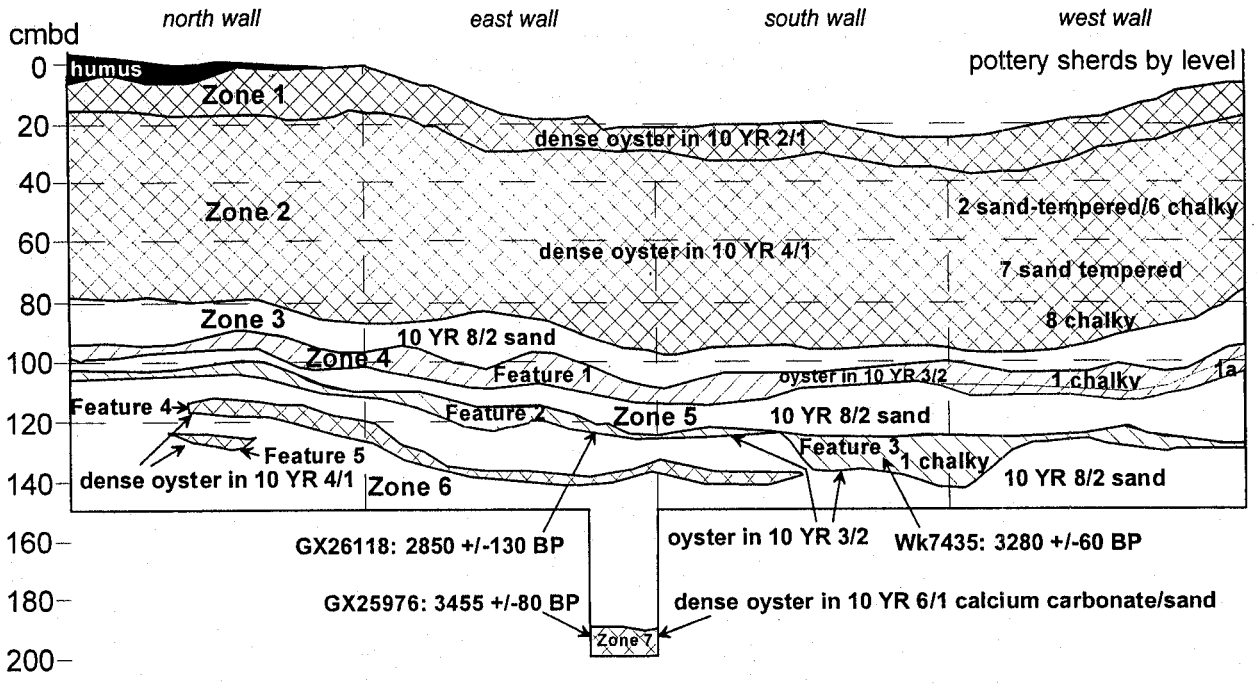

Figure 3. Excavation Unit 1 wall profiles.

posthole test was excavated in the southeast corner to a depth of 175 cmbd. The matrix sand was the same from top to bottom – large grained particles mixed with highly ground, water worn beach shells indicating deposition by wave action. No artifacts were recovered. We conclude that the sand was deposited during storm activity and that the original ground surface of the interior shell ring, if still present, was not reached by our excavations. Ground water penetration at 160 cmbd prevented further excavation.[4]

Excavation Unit 4

Unit 4 was placed on the north arm of the shell ring at a height a meter or so above mean sea level (Figure 1). The unit was situated in the middle of a dense mangrove swamp only 50 cm above standing water in the surrounding swamp. It was dug to 90 cmbd with two posthole tests being excavated in the northeast and southeast corners to a depth of 140 cmbd.

Dense amounts of oyster shell extended from the surface to 80 cmbd (Figure 6). Two zones, 1 and 2, were apparent in the upper shell midden, distinguishable only by slight changes in color of the soil matrices. A thin layer of sand with moderate amounts of oyster (Zone 3) separated zones 1 and 2 from Zone 4, a dense deposit of oyster shell in a dark sandy matrix. At 70 cmbd groundwater seepage interfered with the maintenance of context. Shovel and trowel excavations were terminated at 90 cmbd and posthole tests placed from 90 to 140 cmbd in the northwest and southeast corners of the unit. These revealed that midden deposits (Zone 4) extended to 130 cmbd. Although sterile sands were reached at 130 cmbd, it is unclear if they represent a C horizon or a sand stratum above more shell deposits similar to the situation found in the lower levels of Unit 1. One conventional radiocarbon date on oyster from an upper level indicates that the ring deposits occurred on or before 3280 +/-80 B.P. (Table 1).

Only three sherds were recovered from Unit 4. As with the other units, the ceramics consisted solely of sand-tempered and chalky plain wares. No other artifacts were recovered from the unit.

Ceramics

All sherds were examined by the authors (Russo and Heide 2000) macroscopically for determinations of sand and chalkiness. Cordell (2000) examined the sherds microscopically under 45x magnification along fresh breaks and other longitudinal sections to identify the presence of sponge spicules, sand, and other temper or inclusions. General observations on the size and abundance of spicules and sand were made with occasional measures of spicule size being undertaken (Cordell 2000).

Only two types of ceramics were identified. One, typically called St. Johns Plain, is characterized by the presence of abundant sponge spicules, and is referred to here as spiculate or chalky wares (n=44) due to the fact Joseph Reed lies outside the St. Johns region, the accepted home territory of the type (Figure 7). The other, typically called Glades Plain in South Florida, is characterized by abundant fine to medium sized sand particles, and is referred to here as sand-tempered plain (n=19) due to the fact they have been identified outside their temporal norm. None of the chalky wares contain sufficient sand of a coarseness to be classified under the type name Belle

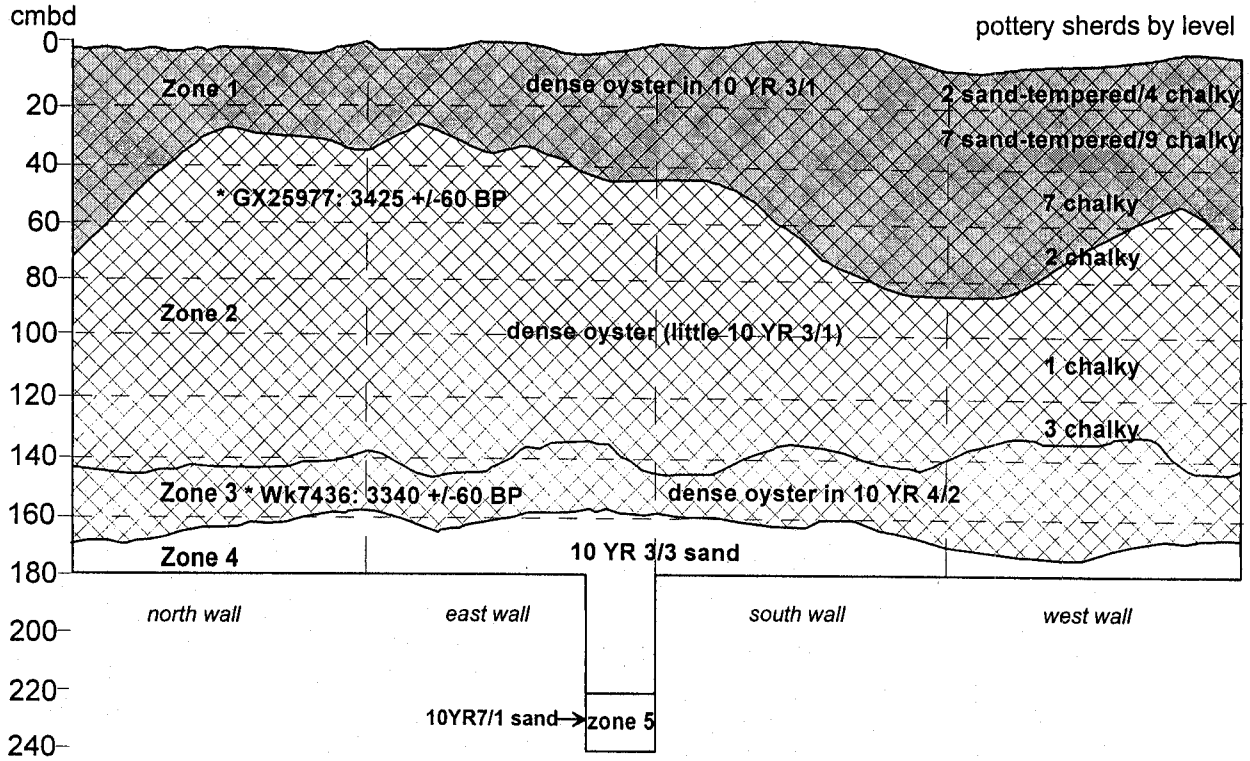

Figure 4. Excavation Unit 2 wall profiles.

Glade as defined by Cordell (1992). In Units 1 and 2, and to a lesser extent Unit 4, chalky wares alone were found in the lower levels while both chalky and sand-tempered wares were found in the upper levels. Samples are too small to apply definitive stratigraphic significance to this distribution.

Only three rims and two bases were recovered. The base fragments were chalky plain wares from Unit 2. The bases of both vessels were relatively thick (ranging between 13-16 mm; Figure 8-D indicates the largest base fragment). They were similar to Late Archaic period, fiber-tempered flat bottomed vessels (cf. Sassaman 1993:145, Figure 22) and the Transitional period vessels described in Bullen (1958:338, 1959:45, 1971:67). One chalky plain rim sherd with a flat lip and little-to-no curvature (Figure 8-A) suggests a straight sided, deep vessel also found in the Late Archaic, or Transitional periods (Bullen 1959:45, 1971:67). Of the only other rims, one was flat lipped and spiculate (Figure 8-B) and one was round lipped and sand-tempered (Figure 8-C). Both were too small to determine vessel form or size.

Faunal Remains

Based on observations of all deposits during excavations, judgmental collections of large fragments of bone from ¼" screen, and analysis of a small sample of fauna from Feature 3, the occupants of the Joseph Reed Shell Ring consumed oyster in greater numbers than other faunal species. All vertebrate remains collected from the ¼" screens (see Russo and Heide 2000 for a complete list) were of taxa also found in a 1/16" screened sample from Feature 3 (Table 2) except for the following (numbers of fragments in parentheses): deer (7), mammal (3), bird (1), soft-shell turtle (1), and Jack crevalle (4). Most of the ¼" screen recovered bone consisted of fish (213) and turtle (50). Mammal contributed only ten fragments, out of a total of 275 fragments identifiable beyond vertebrata classification (Russo and Heide 2000).

Feature 3, a small pit feature, had far greater numbers of vertebrate remains than any other context encountered, suggesting that vertebrate resources played a variably significant role in the diet of the shell ring occupants. Table 2 lists all vertebrate taxa identified from the feature as well as non-commensal/incidental shellfish. Analysis indicates that freshwater environments were exploited for bowfin, gar, and at least three kinds of turtle, while the Atlantic Ocean and beach provided the likely exploitable environments for sea turtle. However, estuarine environments yielded most of the fish and shellfish recovered from Joseph Reed.

Hard clam (*Mercenaria* spp.) was identified in all units, although it was present in large numbers only in Unit 4. Analysis suggested a summer period of collection for the clams from Unit 4 (Russo and Heide 2000). Analysis of a limited sample of *Boonea impressa*, a parasite of oysters, suggests a fall collection of the oyster in Feature 3 (Russo and Heide 2000). Biologists at Hobe Sound/Loxahatchee Wildlife Refuge have determined that the most sea turtles today nest on the beach between February and May (Leatherbacks, *Dermochelys*

Table 2. Faunal remains from Unit 1, Feature 3, Joseph Reed Shell Ring.

Common name	Taxon	NISP	Grams	MNI
Oyster	Ostreidae	56,169	1,4056.6	0
Crested oyster	*Ostrea equestris*	10	11.41	10
Eastern oyster	*Crassostrea virginica*	1,322	12,116.87	709
Crab	Brachyura	3	.09	3
Blue crab	*Callinectes sapidus*	1	1.22	1
Commensal/ incidental shellfish	26 taxa, mostly land snail, barnacle, mussel	5,265	226.44	1,300
Vertebrata	Vertebrates	16,566	99.64	0
Requiem shark	Charcharhinidae	12	65.5	1
Bony fishes	Osteichthyes	1,998	29.03	0
Gar	*Lepisosteus* spp.	5	.11	1
Bowfin	*Amia calva*	1	.02	1
Herring	Clupeidae	3	.01	1
Sea catfish	Ariidae	31	4.53	3
Grunts	*Haemulon* sp.	1	.04	1
Atlantic croaker	*Micropogonias undulatus*	3	.19	2
Grouper	*Mycteroperca sp.*	1	.3	1
Drums/sea trout	Sciaenidae	1	.43	0
Red drum	Sciaenops ocellatus	1	.15	1
Mullet	Mugil spp.	17	.71	1
Turtles	Testudines	17	30.94	0
Mud turtle	Kinosternidae	1	.21	1
Cooter/slider	*Chrysemys* spp.	2	2.98	1
Sea turtle	Chelonidae	3	8.1	1
Snake	Colubridae	4	.7	1

coriacea), and May and June (Green turtles, *Chelonia mydas*; Loggerheads, *Caretta caretta*) with occasional members of the latter two species extending nesting into August (Marion Bailey, personal communication). Assuming the sea turtle remains found at the site were collected in the spring/summer when they come ashore to lay eggs, then the preliminary picture we get is of a multiple seasonal occupation (spring, summer, fall) at Joseph Reed. Certainly more seasonal analysis is needed to provide definitive evidence of seasonal, or possibly year-round, occupation.

Joseph Reed Shell Ring: Subsistence and Feasting

The Joseph Reed Shell Ring represents a Late Archaic shell ring built around an average conventional age of 3300 B.P. (cal. 3527-2746 B.P.), near the end of the Archaic shell ring building tradition (Figure 10). At 250 meters across it is among the largest shell rings in North America. In size and shape it fits most closely to the Rollins Shell Ring in Northeastern Florida, which also has an outside diameter of approximately 250 meters (Figure 2) and was occupied on a conventional radiocarbon average around 3500 B.P.

It has been suggested that the Rollins Shell Ring functioned as a site where ceremony and feasting took place (Russo and Saunders 1999; Saunders 1999). What ceremonies occurred coincident with the feasting are unknown. With the exception of ceramics and worked bone, artifacts are few, with exotic items limited to occasional chipped stone flakes. Like all other Archaic shell rings, little to no evidence of social hierarchy, extensive trade, or inter-regional interaction is evident in the artifact assemblage.[5] Pottery and bone pins seem mostly mundane and utilitarian. When elaborated, most of the decorations such as incising on bone pins and ceramics, seem not to differ from those on similar artifacts found in non-ceremonial contexts. Utilitarian artifact assemblages also characterize two other Late Archaic Florida shell rings, Horr's Island and Bonita Bay, both of which yielded undecorated, mostly utilitarian shell tools, but lacked ceramics. In comparison, the small samples from the Joseph Reed Shell Ring did not produce shell tools. But the handful of undecorated ceramics, bone pin fragments, and lithic flakes, like most other Late Archaic shell rings, do not, at first view, indicate uses beyond utilitarian needs

The four excavation units placed at the Joseph Reed Shell

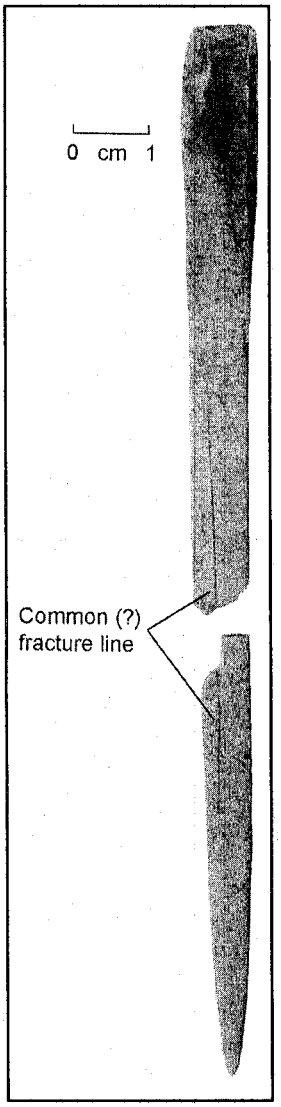

Figure 5. Bone pin fragments from Unit 2.

Ring established that the ring was built during the Late Archaic by peoples who manufactured or received chalky and sand-tempered plain pottery, with, perhaps, chalky wares preceding the introduction of sand-tempered wares. The initial stages of the shell ring, have not yet yielded evidence of pottery (see Russo and Heide 2000), and, thus, it remains unclear if aceramic peoples built the first stages of the ring. Too, it remains unknown if the central open area of the ring remains intact beneath storm deposited sands or has been swept away by storm waves and tides. And it is unknown if the ring ever formed a completed circle prior to erosion, as has been suggested by oral history (Fryman et al. 1980). The ring as it stands today is an asymmetrical half circle, evidently eroding on its eastern edges from wave and storm action with widely varying amounts of shell in terms of thickness and height distributed along its remaining circumference (Figure 1).

At other ring sites evidence of subsistence/feasting in the form of hearths, roasting pits, storage pits, and midden deposits have been found under and on the interior edge of the ring, indicating use of the area prior to shell deposition (Russo and Saunders 1999; Trinkley 1980, 1985, 1997). At Joseph Reed, excavation units were of inadequate depth and size to make definitive determinations of site use prior to shell mounding for ring construction. Only in Unit 1, did lower levels suggest non-shell mounding activities prior to ring construction, i.e., thin deposits of shell midden indicative of activity floors, pits, and charcoal features (Features 1-5) that alternated with deposits of clean, white sand. The use of white sands in Florida Archaic sites has been linked to ritual contexts (Aten 1999; Russo 1991, 1994). It is possible that the alternating white sand deposits between Features 1-5 were ritual deposits prefatory to the massive mounding of shell that makes up most of the shell ring above these features (Figure 3). However, no similar evidence of ritual activity was apparent in the lowest levels of Units 2 and 4. Although white to lightly colored sands (the color possibly due to pedogenesis) were identified in the lowest levels in both units, whether they represent natural or cultural deposits is unclear due to the small (post-hole) size of the excavations at these levels.

Save for slight differences in color and amounts of soil in the main shell deposits which make up the bulk of the ring, the shell deposits appear largely undifferentiated and suggestive of large piles of refuse dumped in short periods of time, a characteristic of public feasting (Hayden 1996; VanDerwarker 1999). That is, rather than accretion of small scale domestic and/or ritual activities, the larger episodes of mounding of shell are indicative of larger scale feasting.

Because vertebrate and other shellfish remains are found among the oyster dominated zones and features, it is not likely that the Joseph Reed site served only as an oyster feasting arena or as an oyster processing station. A number of subsistence/feasting activities can be inferred from the kinds and manner of distribution of the faunal remains. The most abundant numbers of faunal specimens come from oysters and small fish. Even those species of fish that can obtain relatively large size such as gar, bowfin, grouper, redfish, and requiem sharks were of small sizes in the Feature 3 assemblage. Mullet, herring, grunts, and croaker are smaller sized schooling fish. Along with sea catfish, they are among the most productive of inshore, estuarine fish. We can assume that factors of plenty, convenience, expedience, and reliability of capture were primary reasons behind their selection as food items. Although species of larger sizes such as deer and sea turtle were utilized at Joseph Reed, they are uncommon at the site and were certainly not relied upon to feed the masses their daily rations. These species are only seasonally present or are otherwise rare on small barrier islands such as Jupiter Island on which the Joseph Reed Shell Ring lies.

Somewhat surprising is the presence of freshwater species of turtle, including mud turtles, cooters, and soft-shells, and fish such as bowfin and gar. Today there is no natural freshwater habitat that would support these animals on Jupiter Island in any significant numbers. Their presence at the site suggests either some significant environmental change resulting in the removal of former, nearby freshwater habitats (not altogether unlikely given sea rise over the last 4,000 years, the perpetual process of opening and closing of inlets due to storm activity and longshore drift, and modern environmental disturbance, e.g., the adjacent construction of the Intracoastal waterway), or that the animals were brought to the site from some mainland freshwater source. In freshwater streams and ponds, the species identified at Joseph Reed are quite common and easily captured, particularly during low water levels brought upon by drought when turtles, bowfin and gar are among the last faunal resources to survive.

In summary, while the large mounded piles of shell in the ring primarily consist of oyster, the presence of other species indicates that oysters were not the only faunal species providing subsistence at the site. Easily captured and common freshwater and saltwater species of fish and turtle were utilized. However, for every fish or turtle eaten, thousands of oysters were consumed. The massive intake of oysters left behind a far greater residuum than the remains of all other species combined. It is most likely, and is supported by the limited evidence from the three midden units, that Joseph Reed

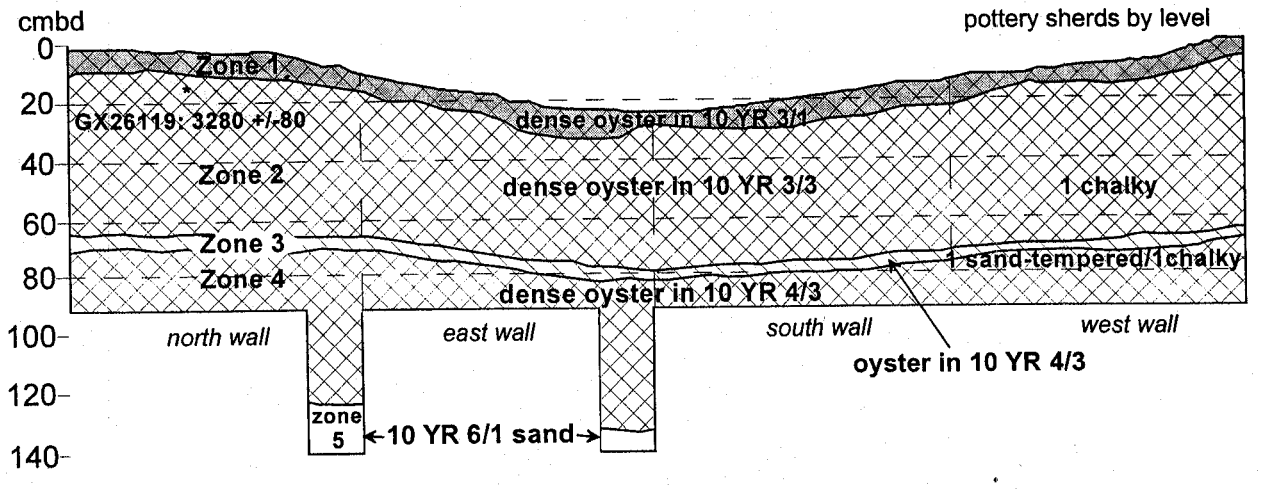

Figure 6. Excavation Unit 4 wall profiles.

was built in a manner similar to that evidenced at the more intensively investigated Rollins Shell Ring. Mounded piles of shell coalesced through successive feasting episodes in which oysters contributed the greatest amount of discard.

The size and nature of feasts varied at the site. Any large single pile of oyster at Joseph Reed could have provided a meal's worth of subsistence for hundreds of people, while within these large piles occasional and concentrated remains of fish, turtle, deer, and other shellfish indicate smaller feasts or quotidian household consumption occurred. Feature 3 reflects subsistence sufficient only for a handful of people. In the smaller scale feature we find evidence for a greater diversity of species and inclusion of freshwater species which were likely exotic to the site and took more energy to recover than locally available shellfish. However, regardless of the size of individual deposits of faunal remains, oyster was the primary subsistence item in terms of frequency of use, in virtually all midden contexts.

It is important to note, however, that oyster was not only a food item and its residual shell, an incidental discard. Intentional mounding of oyster shell provided the foundation for the ring and organizing framework for ceremonies at the site. The piling of shell was not equally distributed around the circumference of the ring. The southeastern corner of the remaining ring structure, for example, contains far more shell, as measured by height, than western portion of the ring (Figure 1). We suggest that this differential mounding was intentional as was the circular pattern in which the shell was placed. These points are critical to understanding the function and appearance of pottery at the mound, and are addressed below.

Comparing Joseph Reed to Other Shell Rings

Were the people who built the Joseph Reed Shell Ring related to any of the other shell ring producing cultures in the Southeast? To date, the Southeast Late Archaic coastal landscape manifests upwards of 60 shell rings and an uncounted number of what seem to be distinctive shell ring-producing cultures distinguished by their unique shapes, artifact assemblages, and dates of occupation (Figures 2, 9, and 10).

South Carolina

Along the central South Carolina coast, Thom's Creek sand-tempered pottery producers constructed a number of shell rings between 4200 to 3200 B.P. (Sassaman 1993; Trinkley 1985; Figure 10). Rings vary widely in size from 30 to over 100 meters in diameter (Saunders 2001) and are generally circular to semi-circular. While Thom's Creek peoples were contemporaneous with Joseph Reed occupations and did make sand-tempered pottery, they are among the most distant shell rings from South Florida. In addition, the Thom's Creek pottery is often poorly fired and decorated with punctations, incisions, and other designs (Trinkley 1976), unlike the plain sand-tempered wares from Joseph Reed. Ceramics are often very abundant and variably include fiber-tempered types and clay balls; worked bone objects are common; while chipped lithic tools and exotics are rare.

Georgia

Near the Savannah River and south into coastal Georgia, the St. Simons culture built circular to semi-circular shell rings up to 90 meters in diameter from 4300 B.P. to at least 3700 B.P., somewhat earlier than Joseph Reed although dated sites are rare and may not cover the full range (Figure 10). The ceramic assemblages differ from Joseph Reed in that they are often abundant, consist of fiber-tempered wares, and often exhibit designs. Other common artifacts often include bone pins, while less frequently baked clay, ground stone, shell tools, and chipped lithics are found (Marrinan 1975; Waring and Larson 1968).

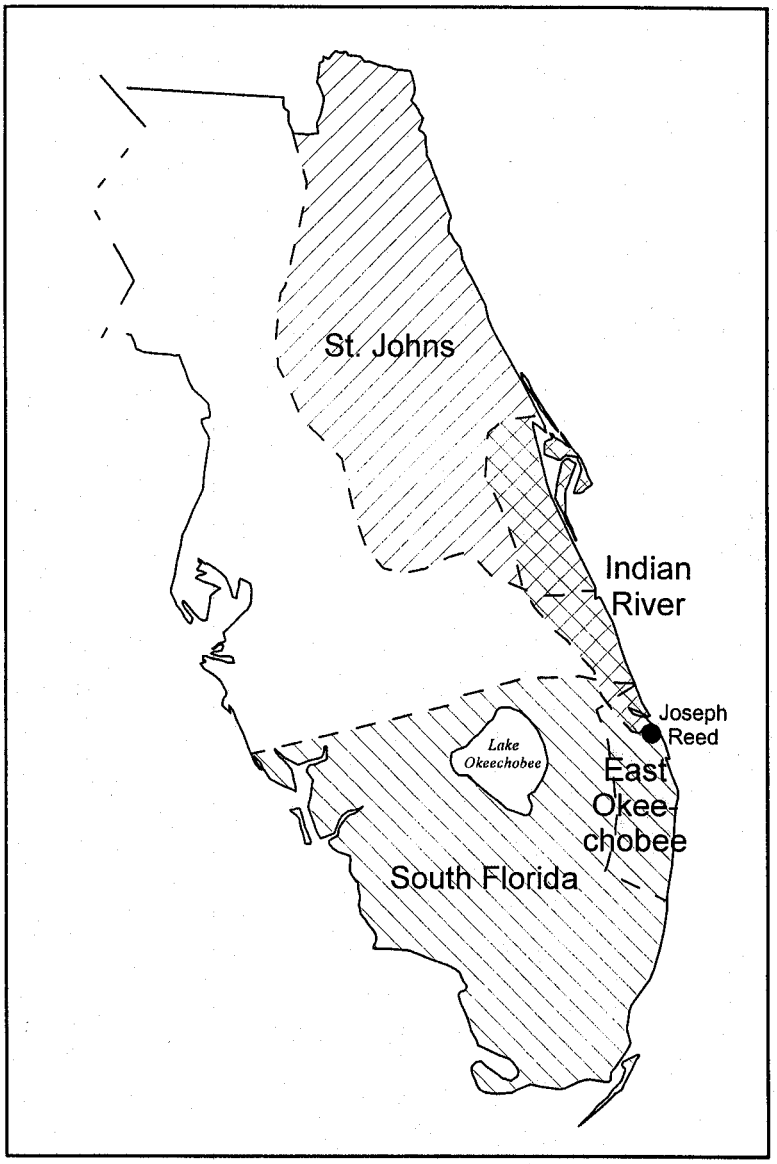

Figure 7. East and South Florida culture regions (St. Johns after Milanich 1994, Indian River after Rouse 1951, East Okeechobee after Carr and Beriault 1984, South Florida after Widmer 1988).

Northeast Florida

Some 270 miles north of Joseph Reed at the Oxeye site, a non-pottery producing culture whose members cooked with clay balls, built a circular shell ring over 150 m in diameter at the mouth of the St. Johns River around 4500 B.P. (Russo and Saunders 1999; Figure 10). Virtually no artifacts have been recovered other than a few fragments of baked clay and a few lithic flakes. The early date precludes a direct connection to Joseph Reed, while the absence of ceramics, presence of baked clay objects, and paucity of artifacts precludes affirming any derivative connections between their material cultures.

Nearby, a fiber-tempered ceramic producing group, the Orange culture, built a large ring at the Rollins site around 3700 to 3500 B.P. (Russo 1992; Russo and Saunders 1999; Russo et al. 1993; Saunders 1999). Fiber-tempered pottery manufacturers also constructed the Guana River shell ring, some 30 miles south of Rollins. That site, which is currently under investigation by the authors and other members of the Northeast Florida Anthropological Society, has yielded two conventional radiocarbon dates from oyster of 3860 +/-60 and 3600 +/-50 B.P. (Beta 154816 and Beta 154817, respectively). The Rollins and Guana shell rings are roughly circular and are large, 240m and 160 m in greatest diameter respectively (Figure 2). Both have large openings on their southeast sides. Pottery from undisturbed contexts is solely fiber-tempered and relatively abundant at both sites, but abundances vary throughout the rings. Bone pins are fairly common, but lithics and other artifacts rare.

Southwest Florida

On the southwest Florida coast one or possibly two distinct and unnamed cultures produced shell rings at Horr's Island and Bonita Bay between 4400 and 4100 B.P. (Figure 10). Although these rings are geographically the closest to Joseph Reed (Figure 9), they are of a period up to a thousand years earlier than Joseph Reed (Dickel 1992; Houck 1996; Russo 1991, 1994). As is the case at Joseph Reed, the sites have yielded sandstone and/or limestone artifacts and bone pins. But an absence of pottery and the presence of shell tools at the sites serve to distinguish them from Joseph Reed. Although samples are small, to date Joseph Reed has failed to yield shell tools and does not seem to contain the abundance of shell tools found at Horr's Island. Also, Horr's Island and Bonita Bay shell rings' associations with sand/shell ceremonial mounds and their elongated U-shapes (150 m and 240 m in length respectively) distinguish them from the semi-circular (and presumably, formerly circular) Joseph Reed (Figure 2).

Northwest Florida

The Florida panhandle contains at least two horseshoe-shaped shell middens, the Elliott's Point period Buck Bayou site and Late Archaic Meig's Pasture site measuring 125m and ca. 100 m respectively (Curren 1987; Thomas and Campbell 1991). These structures, however, seem distinctively different in shape – Meig's Pasture being a series of shell piles and pit features in a circular arrangement and lacking ceramics, while Buck Bayou is a mounded midden. Meig's Pasture seems the older site at around 3900 B.P. (Figure 10), but both are marked by a lack of ceramic pottery (except near the surface at Buck Bayou [Thomas and Campbell 1991:116]) and the presence of baked clay objects suggesting that their cooking styles were distinct from those at Joseph Reed which lacks baked clay. The sites also have lithic tools, both chipped stone and ground stone including steatite, and other exotics that distinguish them from Joseph Reed. How

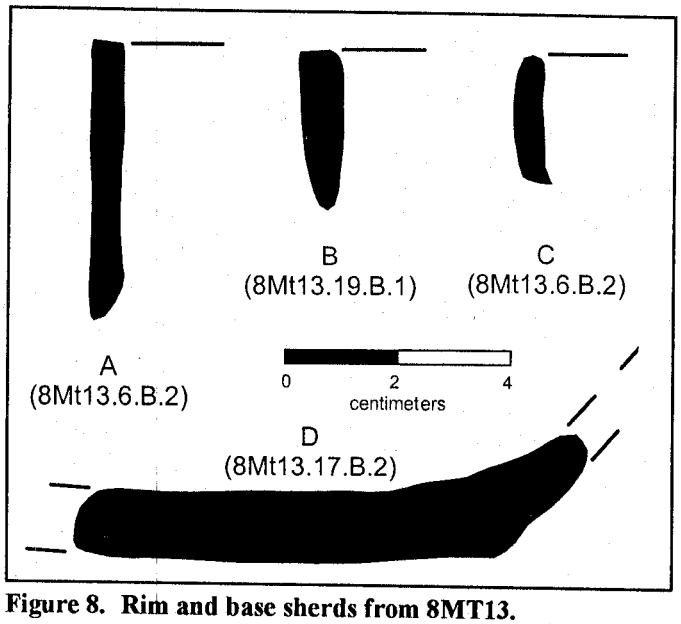

Figure 8. Rim and base sherds from 8MT13.

common these items are is unclear (cf. Curren 1987:74; Thomas and Campbell 1991:108, 112). The same may be said of bone pins and shell beads and tools which are from industries termed "moderately active" at Elliott's Point sites in the region, but whose abundance at Buck Bayou is not stated in published accounts (Thomas and Campbell 1991:108).

Mississippi

The Late Archaic Cedarland and the Poverty Point period Claiborne shell rings of coastal Mississippi, dating between 3200 to 3100 B.P., but perhaps as early as 4000 B.P. (these ages are uncorrected and based on charcoal, cf. Bruseth 1991; Gagliano and Webb 1970), may overlap in age with the Joseph Reed Shell Ring. Before they were destroyed, both sites were rather large, measuring between 165 and 250 meters in outside diameter, respectively, and were semi-circular with openings to the west. At least one author, however, sees the Cedarland site as less a distinct shell ring with a sterile central plaza, than a shell/earth midden with extensive deposits in the interior and adjoining the exterior of a ring-like embankment (Bruseth 1991:9). Significantly, Cedarland did not contain pottery. Unlike Joseph Reed, both sites were remarkable for their abundances of artifacts including exotic lithics and other trade items. While Cedarland was comprised of oyster and earth, Claiborne contained much more *Rangia* clam.

Joseph Reed: A Separate Shell Ring Culture

Archaeological cultures are defined by recurring assemblages of traits such as artifacts, burial methods, architecture, subsistence patterns that serve to distinguish one group of sites from others. While trait comparisons alone do not preclude the possibility social relations between materially dissimilar cultures (e.g., Sassaman 1993), they do serve as the basis for distinguishing the level of material relatedness among archaeological cultures and among sites within the same culture. With this in mind, and as the overview above has demonstrated, we can identify at least seven and up to twelve distinct Late Archaic cultural traditions, which have arisen around the construction of shell rings in the Southeast during the period 4500-3000 B.P. These may include separate, but, perhaps, related traditions at closely spaced sites such as Claiborne and Cedarland, and Buck Bayou and Meig's Pasture; or more widely geographically and temporally spaced traditions as Horr's Island and the South Carolina rings. Undoubtedly, even more distinct material traditions will be identified as details on the numerous shell rings in Georgia and South Carolina are obtained.

The Joseph Reed peoples participated in many of the Late Archaic coastal traditions of the Southeast. These included the massive consumption of and dependence on shellfish and fish, the deposition of shell refuse in the shape of rings, the importing and use of chipped lithic tools, the early use of pottery, and the manufacture and use of bone pins. They share with many other Late Archaic shell ring sites an absence or paucity of exotic objects, easily definable prestige items, and burials. Distinct from Joseph Reed are Bonita Bay, Horr's Island, and Oxeye, which predate Joseph Reed by hundreds of years and lack pottery. The shape of the rings and presence of mounds also distinguish the southwest Florida sites. Also distinct from Joseph Reed are the closest pottery yielding rings, Rollins and Guana, and, in fact, most ceramic-containing Late Archaic rings, which were built by people who manufactured fiber-tempered wares. South Carolina rings were made by peoples who produced sand-tempered pottery, but these wares were decorated, often thicker, and more poorly fired (Trinkley 1976).

As such, we suggest that the Joseph Reed site was yet another in the catalogue of distinct shell ring cultures that dotted the Late Archaic landscape. The material culture is characterized by the use of thin and thick walled, hard, sand-tempered pottery; the use of spiculate wares; bone pins; chipped lithics brought in from exotic regions; subsistence dependent on shellfish and fisheries resources; and large scale feasting and small scale consumption of these resources. Other than the use of a large shell ring for ceremonies, however, the regional settlement pattern is a mystery. No contemporary sites are known from the region.

Early Non-Fiber-Tempered Pottery: Joseph Reed and Florida[6]

Because the Joseph Reed pottery is unique among shell rings, it suggests a totally distinct tradition. However, there are some indications that extra-regional interactions did occur in the ceramic realms. Although ceramic samples are very small, they do so far suggest that flat bottom, steep sided vessels are present, and these forms are typical of contemporaneous fiber-tempered pottery used to the north. And, although the ceramic pastes types are unusual, they are not unknown in contemporary contexts outside the region of East Okeechobee.

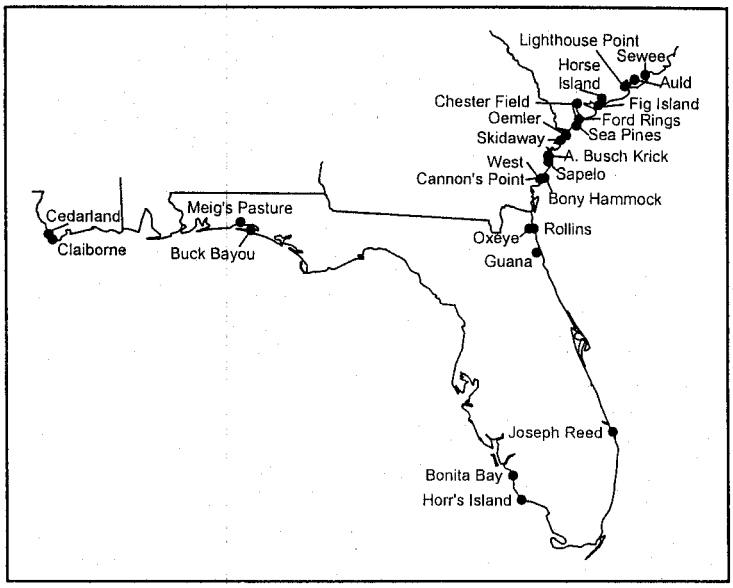

Figure 9. Selected Archaic shell rings in the Southeastern U.S.

Archaeologists typically link the introduction of spiculate pottery in North America to the St. Johns I period peoples of the St. Johns region of East-central Florida between 2500 and 2000 B.P. While the heartland of that region lies 200 miles north of Joseph Reed (Figure 7), peoples of the Indian River Region, which abuts Joseph Reed, are also thought to have begun using this pottery at about the same time (Milanich 1994; Rouse 1951). However, in East Okeechobee, the region in which Joseph Reed lies, St. Johns spiculate wares have been identified as indigenous only at the far more recent time of 1200 B.P. (Pepe and Jester 1995:20; Figure 11), while elsewhere in South Florida they are usually considered to be trade wares (Carr and Beriault 1984:6). In short, at 3300 B.P., spiculate pottery producing cultures are not known in the Southeast U.S., and specifically, they are unknown for the East Okeechobee region in which Joseph Reed lies. Fiber-tempered variants are the only pottery wares widely accepted to have been in use in Florida at this time. However, even fiber-tempered pottery is largely unknown in most of South Florida until 2500 B.P., being found only at a few marginal sites, in small amounts, or as isolated extra-regional trade (Carr and Beriault 1984; McGoun 1993:66; Pepe and Jester 1995:16; Widmer 1988:72). In general, although a variety of pottery types have been found in pre-2500 B.P. contexts in South Florida, pottery of any type at 3300 B.P. is so rare or absent in South Florida, archaeologists have had difficulty explaining its occasional presence as anything other than limited extra-regional exchange.

While the presence of spiculate wares in such early South Florida contexts is puzzling, the sand-tempered wares from Joseph Reed at such early dates are equally problematic. In most of South Florida sand-tempered wares were not common until after 2500 B.P. They become more widespread through time, but at 3300 B.P., sand-tempered wares are not thought to have been produced in South Florida (Carr and Beriault 1984; McGoun 1993; Milanich 1994:301; Pepe and Jester 1995), or, for that matter anywhere in the Southeast U.S. except South Carolina. Initial development of sand-tempered pottery in South Florida is traditionally placed around 2800-2500 B.P. Sand-tempered wares are seen as South Florida's autochthonous pottery, variants of which become the primary component of all South Florida cultural pottery assemblages that follow.

With this in mind, two aspects of the Joseph Reed pottery run counter to existing views on ceramics in Florida. One, the ceramics at Joseph Reed consist of both sand-tempered and chalky wares at a time when most archaeological chronologies indicate these wares are unknown elsewhere in Florida. Two, chalky wares seem to precede or at least co-exist with the production of sand-tempered wares prior to 2800 B.P. in possible contradiction to the assumed temporal priority of sand-tempered wares in the region. To help resolve these apparent anomalies, we need to look at the developmental process and uses of ceramic chronologies. They represent syntheses which, by necessity, overlook exceptions to temporal trends to arrive at generalized patterns of distribution through time. If we look at some of the rarer ceramic types excluded from most generalized Florida ceramic chronologies, then early sandy and chalky wares at Joseph Reed do not, perhaps, appear as exceptional as they do at first glance.

In Florida, non-fiber-tempered pottery produced during the Late Archaic before 3000 B.P. is evidenced at a number of sites. At the J-5 site in the panhandle, Bullen (1958) identified St. Johns associated with Orange wares in a context dated to 3150 B.P. At the Caxambas site on Marco Island along the southwest Gulf coast three charcoal samples from a shell midden yielded conventional ages of 3155, 3375, and 3400 B.P. (Buckley and Willis 1972; Table 1). Associated with the dates were sand-tempered plain and fiber-tempered wares. Twenty miles north at Mulberry Midden, Lee et al. (1993) dated two shell samples from the sand-tempered plain bearing stratum which yielded conventional dates of 3390 and 3430 B.P. (Table 1). At the Palmer/Hill Cottage site Bullen and Bullen (1976) described two levels in the large shell midden as containing Orange, St. Johns, and sand-tempered wares. Radiocarbon assays on shell from these levels yielded conventional dates of 3625 and 3750 B.P. (Table 1). At the Cato site 70 miles north of Joseph Reed, Bullen et al. (1968) excavated a St. Johns ceramic bearing shell midden with a date of 3195 B.P., a date within the range of dates from Joseph Reed.

Some of these dates can be easily dismissed. For example, the direct association of the radiocarbon dated Cato material with St. Johns pottery has been called into question (Heide 2000). On the other hand, early radiocarbon dates have been rejected as associated with pottery only after much deliberation. For instance, in a well reasoned article, Lee et al. (1998) argued that at Heineken Hammock in Southwest Florida, three dates (4000-4500 B.P.) on shell from the same levels as sand-tempered wares did not date the pottery from the same levels. The dates were dismissed, in part, because the thin site seemed subject to causing pottery to migrate to lower levels, but also,

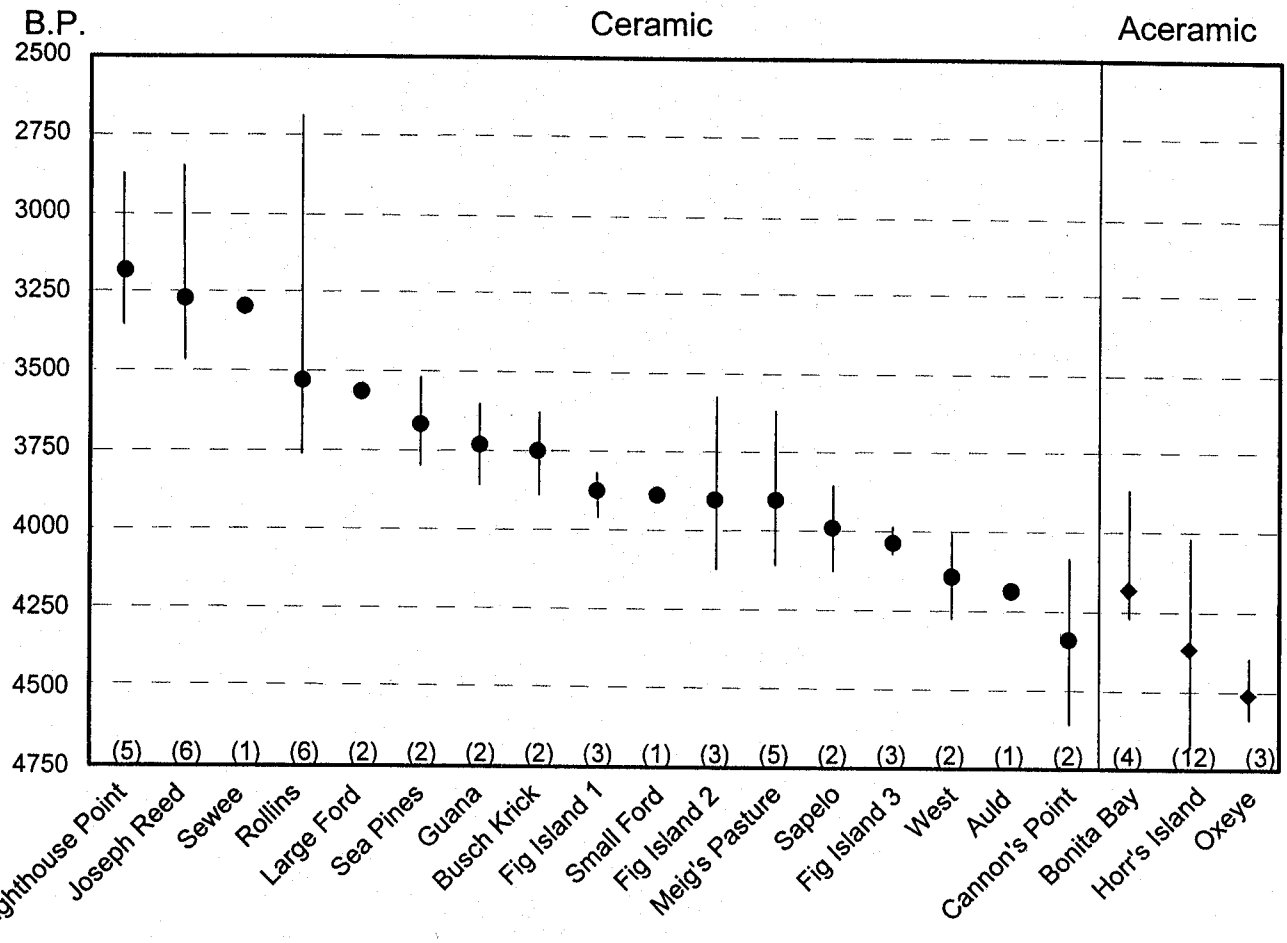

Figure 10. Conventional radiocarbon dates of Southeastern U.S. Archaic shell ring and ring-like sites. Center point is the average of all dates (number in parenthesis) from the ring. Vertical bars represent the range of the conventional dates.

in part, because the dates seemed too early (Lee et al. 1998:238). A date of 2500 B.P. seemed more reasonable because and certainly fit the locally accepted chronology.

A number of the cited early pottery dates come from "mixed" ceramic components. These have been linked to Bullen's (1959) Transitional period, whose earliest beginnings lie between 3000 to 2500 B.P. However, all of the radiocarbon ages actually predate this period. Ultimately, Bullen came to recognize that at least three "new" (i.e., non-fiber-tempered) ceramic series existed in Florida before 3000 B.P., St. Johns wares, Pasco or Perico limestone tempered wares, and Norwood semi-fiber-tempered wares (i.e., tempered with fiber and sand) (Bullen 1971:64). These early ceramic traditions, however, have never been widely accepted for South Florida (cf. Carr and Beriault 1984; Griffin 1974; Milanich and Fairbanks 1980), and only one attempt to enter all these into a formal chronology for South Florida has been presented (Widmer 1988[7]). While not everyone agrees with Widmer's chronology (e.g., Milanich 1994; Lee et al. 1993:50), with some specifying the contextual problems of the data upon which it is built (Griffin 1988:132; Heide 2000; McGoun 1993:56, 76; Russo 1991), the significance of Widmer's attempt to place South Florida's earliest dated pottery types into a formal chronology is that it does deal with unusual pottery occurrences. Some of these appear to have been derived from sound contexts (e.g., Lee et al. 1993) that accepted chronologies do not otherwise take into account.

Our point is that the ceramics from Joseph Reed may not be as out of sequence as they first appear. Although unilinear assumptions normally place fiber-tempered pottery preceding non-fiber-tempered wares, in many areas of Florida various ceramics co-existed with fiber-tempered pottery production. This occurred not only during the so-called Transitional period circa 3000-2500 B.P., but earlier. What is unusual about the Joseph Reed site, perhaps as much as the earliness of the non-fiber-tempered ceramics, is the absence of fiber-tempered wares associated with them.

Ceramics and the East Okeechobee Area

Chronology

As a distinct culture area, East Okeechobee was first described by Carr and Beriault (1984; Figure 7). They

recognized that it was "the least known region in southern Florida" and, at the time, that it had no intra-regional radiocarbon dates to even suggest periods of occupation and ceramic production. Recently, however, radiocarbon dates have been obtained from coastal sites in the region associated with fiber-tempered pottery at Mt. Elizabeth (8MT30) circa 4000 B.P. just north of Joseph Reed (Janus 1998); and semi-fiber-tempered pottery at the Scheurich Midden site (8PB9261) circa 3800 B.P. just south of Joseph Reed (Wheeler et al. 1997; Table 1). Aware of the presence of fiber-tempered pottery on the coast, but its absence in the interior of South Florida, Pepe and Jester (1995) have suggested that two separate cultures occupied the East Okeechobee region around 4000 B.P. One, which we will call Coastal Archaic, was located along the coast and used fiber-tempered pottery. Pepe and Jester (1995:17) see this as the extreme southern extension of Orange people migrating from the St. Johns region, but they could be local groups trading with the Orange people. The other, they call the Glades Archaic. It was located in the interior Everglades, including the area between Lake Okeechobee and the Atlantic Coastal Ridge in the East Okeechobee region. People in this area at the time did not produce ceramics.

Taking the coastal culture area concept as well as a late prehistoric ceramic chronology already developed for the region (Pepe and Jester 1995; Kennedy et al. 1993), and adding the radiocarbon dates from Joseph Reed, Mt. Elizabeth and Scheurich Midden, a tentative ceramic chronology for the coastal section of East Okeechobee can be proposed (Figure 11). At the enormous shell complex at Mt. Elizabeth, fiber-tempered ceramics associated with shell from an adjacent unit yielded the earliest conventional date for ceramics in the region at around 4000 B.P. (Janus 1998). Nearby, however, another radiocarbon assay which was not associated with ceramics came in at nearly an identical age. This suggests that 4000 B.P. may be a boundary between aceramic cultures and fiber-tempered ceramic producing cultures either existing or trading into the region.

By around 3800 B.P. fiber-tempered or semi-fiber-tempered ceramics are found at the Scheurich Midden (Wheeler et al. 1997:27; Skye Wheeler, personal communication 2000; Table 1). So far, no fiber-tempered sites post-dating 3800 B.P. have yet been identified in East Okeechobee. Was the area abandoned by Orange pottery producers or did interaction between local and extralocal Orange groups stop? Did aceramic Glades Archaic peoples move in (cf. Pepe and Jester 1995)? Our samples are too small to answer these questions.

Sometime between 3500 and 3300 B.P. (maximum cal. range, 3500-3000 B.P.; Table 1) the first chalky wares appear at Joseph Reed (Unit 2). They are also found in Feature 3 (Unit 1), which dates to 3280 B.P. and above Feature 2, which dates to 2850 B.P. The range, therefore, for early chalky wares at Joseph Reed, and tentatively for the region, is somewhere between 3450 and 2850 B.P. or maximum cal. range, 3500-2700 B.P. (Table 1). This date is as much as 2,200 years earlier than the suggested entry of spiculate wares in the region (Pepe and Jester 1995) and as much as 900 years earlier than the widely accepted entry of spiculate wares into the St. Johns and Indian River regions to the north.

According to Pepe and Jester (1995:19) sand-tempered pottery made its first appearance in the region around 2700 B.P., although no intra-regional dates have yet been obtained to confirm these ages (cf. Pepe 1999 identified 2500 B.P. as the initial introduction). At Joseph Reed, sand-tempered wares are found above Feature 2 (Unit 2), which dates to 2850 B.P. This is only slightly older than suggested by the Pepe and Jester chronology. But sand-tempered pottery is also found below the date of 3280 from Unit 4 which sets their appearance back nearly 600 years. The tentative introduction for sand-tempered plain pottery in the region, then, is placed at 3280 B.P. while the range of the wares from Joseph Reed is from 3300-2800 B.P. or maximum cal. range, 3400-2800 B.P. (Table 1).

Ceramics and the Joseph Reed Shell Ring

Who, then, were the people who built Joseph Reed Shell Ring? The Joseph Reed folks did interact with other Archaic peoples. A single lithic flake from central or northwestern Florida; fiber-tempered vessel forms; two distinct types of pottery, rare for the time, but occasionally found elsewhere in the state contemporaneously; and the use of a common architectural form, the shell ring suggests that the society communicated on some level with others who traded lithics, made pottery, and constructed shell rings. Conversely, the Joseph Reed people manufactured both chalky and sand-tempered pottery while their nearest neighbors to the south and west, the Glades Archaic, may not have manufactured pottery at all, and those to the north made fiber-tempered wares. The absence of Orange wares at Joseph Reed suggests limited interaction with the Orange cultures, or that our samples were too small or were not placed in areas containing fiber-tempered pottery. In either case, it can be definitively stated, the Orange pottery was not used commonly at the site, if at all, provoking the question, why?

The presence of chalky wares at Joseph Reed supports Widmer's (1988) recognition of St. Johns pottery in early contexts in southwest Florida (Figure 11), while the presence of early sand-tempered wares coincide with times in which pottery with similar pastes are found on Gulf coast sites (Buckley and Willis 1972; Bullen and Bullen 1976; Heide 2000; Lee et al. 1993). These early ceramic sites suggest some connection of Joseph Reed to Southwest Florida. The wide dispersal and general rarity of the early pottery sites, unfortunately, prevents easy assessments of the direction and nature of the interactions. Unlike the situation with contemporary fiber-tempered pottery, there seems to be no center of production for chalky and sand-tempered wares before 3000 years ago. So while fiber-tempered pottery finds in South Florida are often attributed to trade from the intensely productive fiber-tempered pottery producing St. Johns region, there seems to be no central area to attribute possible trade of chalky or sand-tempered wares into the region. Indeed, one might argue that chalky and sand-tempered wares, albeit limited, seem

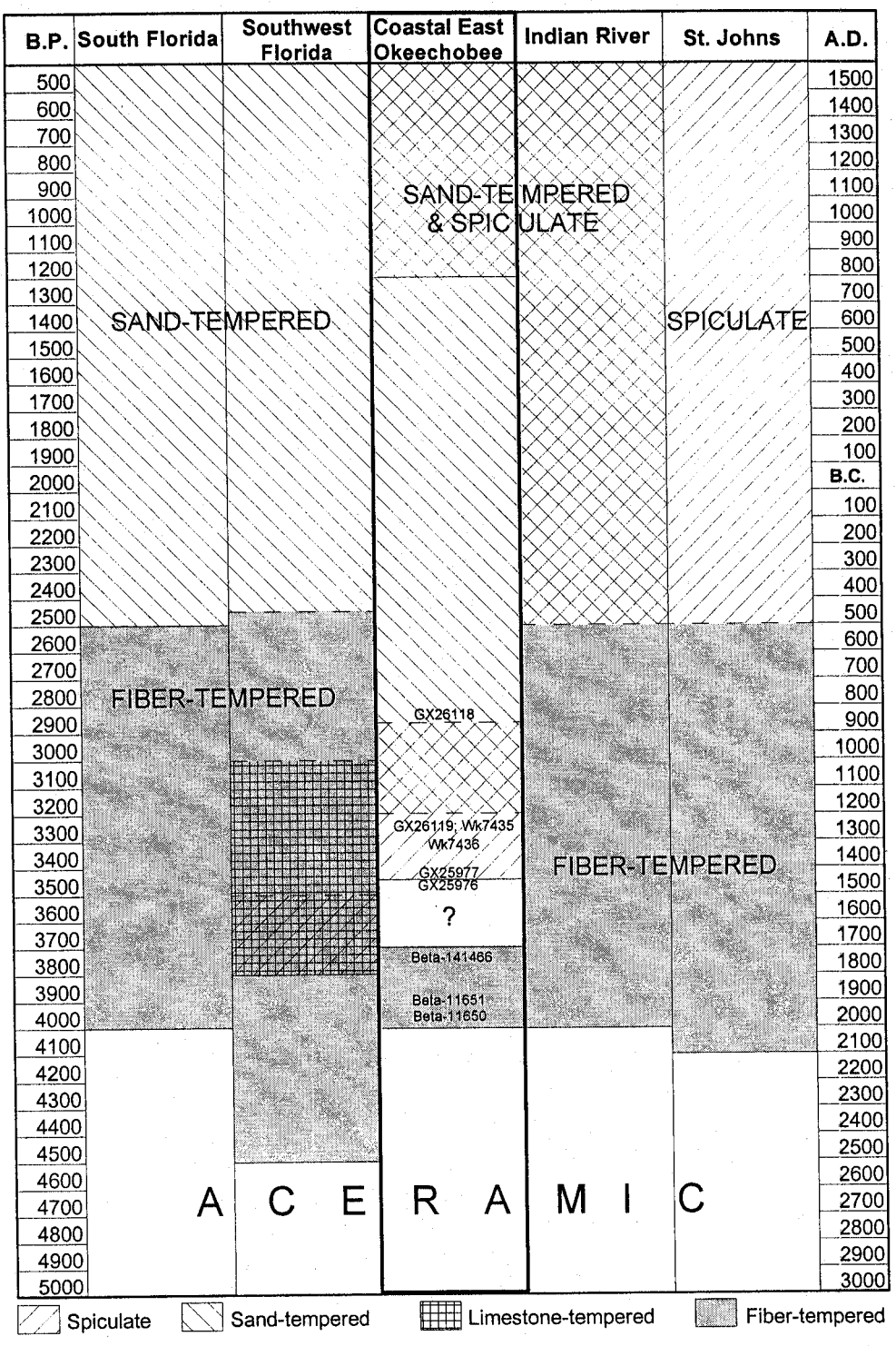

Figure 11. Selected chronologies for dominant ceramics in south and East Florida compared to a provisional chronology for Coastal East Okeechobee (based on Joseph Reed dates; Janus 1998; Pepe and Jester 1995; and Beta 141466). Chronologies adapted from Widmer (1988)[7] for Southwest Florida, Carr and Beriault (1984) for South Florida, and Milanich (1994) for the Indian River and St. Johns regions.

more abundant at Joseph Reed than at most contemporary sites in southwest Florida.

This leads to the conclusion that people at Joseph Reed made or received pottery for use at the site. Why the unique pottery assemblage is found solely at the site and not in the surrounding region may be attributed to site function. If the shell ring served as a ceremonial feasting center, then the early pottery may have been manufactured and used initially for

ceremonial use. Hayden (1995a) suggests that early regional use of pottery arose in settings of incipient socio-cultural inequalities at competitive feasts where it was used as a prestige item to affirm exchange relationships or advertise wealth and success. Under such conditions, pottery may serve as much for display as for subsistence, and may not commonly be found at households outside of ceremonial or ritual contexts. Whatever the cause of pottery development, we do know that so far no sites in the immediate region have been found to be contemporary with Joseph Reed. This may be due in part to the fact that no radiocarbon dates have been run on sites or site components which lack ceramics, a deficiency that begs remedy.

Social Organization at Joseph Reed

We have suggested elsewhere that differential access to food, pottery, and other items of prestige is evident at ring sites (Russo n.d.; Russo and Heide n.d.). In hunter/gatherer societies food is often the primary medium of status and prestige, particularly in the absence of other valued material objects (Woodburn 1981). At shell rings, including Joseph Reed, the ability of certain members of society to accumulate more food than others is reflected in differences in height of shell deposits within the ring (Figure 1). Some portions of the ring exceed 2 meters in height, while others lie on or below current sea level. Units 1 and 2 were placed in portions of the ring containing higher accumulations of shell than Unit 4. Although samples were small, these units also yielded more ceramics and variety of artifacts per volume of shell than recovered from Unit 4. The correlation of large amounts of food remains with artifacts suggests that economic and social inequalities among ring members existed at Joseph Reed.

We cannot say under what form the social asymmetry evident at Joseph Reed was manifest. Certainly more investigations are needed before conclusive interpretation of the functions and social and political organization of the occupants of the site can be ascertained. However, the artifacts recovered so far do not indicate a politically complex chiefdom. Exotic or prestige trade at the site seems to have been limited, suggesting that the ring was not a place led by politically powerful, hereditary chiefs who accumulated great numbers of elaborated objects or exotic items as symbols of their power. While such items are commonly found among later Woodland, and, in particular, Mississippian chiefdoms in the Southeast, they do not characterize the remains from Joseph Reed. Prestige burials, prestige goods, exotic trade items indicative of complex political connections, regional settlement hierarchy, elevated and separate house mounds, temple mounds and other markers of high status we typically associate with later prehistoric groups are not evident at Joseph Reed. Supporting this interpretation is the absence of subordinate chiefdoms (other ring sites?) or settlements which might articulate with the large Joseph Reed site and suggest a hierarchy among sites such as characteristic of politically complex regional settlement.

Instead, we suggest that the social organization at the site was certainly less stratified than politically complex hereditary chiefdoms, but more complex than the simplest egalitarian societies. Elsewhere, the forms of social organizations found in this range have been termed transegalitarian[8] and we use that term here (Hayden 1995b, 1996). Whether the society was a simple chiefdom, big man society, sequential hierarchy, or some other organizational form is indeterminable given the limited data. We can say, however, that social inequality did exist at the site and that inequality provides a key to understanding the development of pottery utilization at the site.

The shell ring community was organized on a level sufficient to bring in and feed numbers of people larger than those identified at any other contemporary, single site in South Florida. The size and shape of the ring site combined with large scale feasting evidence suggests large populations congregated at the site for ceremonies. Such ceremonial elaboration may reflect increases in stress brought about by population or organizational growth in which patterned behavior through the imposition of ritual serves as a controlling mechanism to keep the society together (Johnson 1982; Russo 1991). Such organization necessarily requires leadership to obtain and distribute food resources, quell disputes, orchestrate ceremonies, and otherwise run the place. These leadership roles may be ascribed or achieved, permanent or temporary, and their character likely differed among shell ring sites, which vary greatly in size and organizational/architectural complexity. Due to the limited symbols of status recovered at Joseph Reed (shell and mundane artifacts), the highest status leadership roles were most likely achieved. Leadership and other high status positions had to be worked for. Pottery, so often seen solely as an adaptational/functional innovation, within this social milieu served as a rare and novel material item used to display and reify status and prestige (Russo and Heide n.d.).

Summary

Joseph Reed site may be seen as a place where related corporate groups met for the exchange of mates, marriage, gift giving, the redistribution of foodstuffs, and/or other activities associated with ritual, ceremony, and feasting (e.g., Dietler and Hayden 2001; Weissner and Schiefenhovel 1996). The size of the site could accommodate hundreds, if not thousands of people. The site may have maintained a permanent population with expansion occurring during times of feast and ceremony. Large piles of oyster shell suggest large scale feasting, while smaller deposits suggest smaller scale feasts or daily maintenance activities. Within this expanded population motivated individuals gained and signified their status through the distribution and display of food (e.g., large amounts of oyster) and pottery. The unusual shape of the site and the early pottery set the Joseph Reed Shell Ring apart from all other sites in the region. However, against the broader backdrop of shell ring construction and indigenous pottery development, these phenomena are understandable as a local expression of a common cultural trajectory.

Notes

[1]In order to show the general size and shape of the ring as we observed it in the field, as well as to show the estimated position of our test units, Kennedy's 1966 English measure topographic map was digitized into AutoCAD using a metric scale, converted into X,Y,Z coordinates and a contour map was created using the program Surfer. Problem areas lacking elevation data on Kennedy's map (e.g., the western interior of the ring, and the Atlantic Ocean) were given estimated elevation values. The locations of our excavation units were superimposed on this map based with their locations approximated. With these caveats in mind, the resulting map (Figure 1) should not be seen as an accurate depiction of the ring as it stands today, but rather as the closest approximation currently available.

[2]All radiocarbon dates are conventional ages unless otherwise noted. Many dates based on assays of shell cited herein were not originally published as conventional dates and have been corrected for ^{13}C fractionation in this paper through the Calib 4.3 program (Stuiver and Reimer 1993). This usually results in the addition of some 400 years to their uncorrected age (cf. Stuiver and Polach 1977:358). Archaeologists lacking this program have often added 400 years to an uncorrected date to obtain a conventional age (e.g., Marquardt 1992:12; Russo 1991:424, 1992:110, 1996:183; Sassaman 1998:115).

[3]For South Florida, archaeologists recognize that there are non-artifact bearing strata under ceramic components. Unfortunately, radiocarbon tests on these contexts are rarely undertaken. We suspect the full record of early ceramics remains largely hidden. Most archaeology undertaken in the region has been conducted under cultural resource management projects, the primary goals of which are to meet minimum Section 106 requirements. The establishment and refinement of new chronologies is simply not required or stressed by researchers or reviewers. As such, the temporal placement of plain chalky and sand-tempered ceramics is usually undertaken by slipping them into a standard chronology rather than by dating their contexts or those beneath them. Without more radiocarbon dating, archaeologists will not be able to answer many of the questions associated with the emergence of ceramics in the region.

[4]One reviewer of an earlier draft of this paper suggested that we present evidence with which to persuade the reader that the storms capable of depositing sand in the middle of the ring did not deposit shell "up slope" and "in-shore," i.e., that the large piles of oyster which make up the ring were not due to or disturbed by post-depositional factors. While we do not doubt that the storms which have buffeted the Joseph Reed Shell Ring have dramatically affected its shape, maybe have even removed the entire eastern half of the ring (Fryman et al. 1980), in the three units we excavated within the ring itself (Units 1, 2, and 4), no evidence of the crushed shell/sand matrix typical of shorelines and the interior plaza area was found. In addition, features with Unit 1 indicated that archaeological deposits are undisturbed by storm activity. And radiocarbon dates from the shell seem stratigraphically secure. If reworking of shell by storms has occurred, it awaits for future archaeologists to discover it.

[5]Carr et al. (1995) note that a human bone was recovered by Sears in the1960s according to Sears and Hoffman (1965) and that a 1962 newspaper article stated that human bones were found on the beach near the site after a storm caused severe erosion. This suggested to Carr et al. (1965:54-55) that the site "seems to contain several burials." With this in mind, one of our reviewers suggested that we might consider these remains in our discussion of site function. We did consider them prior to writing the article, but chose to exclude them from discussion, due, in part, to space constraints, but more significantly due to the fact that the number and context of the remains is unclear. One letter dated February 11 (no year) on file at Florida Atlantic University (FAU) to William Sears mentions a package being mailed to FAU which contains "what I think may be part of a human skull which I found on the Reed Wilderness Seashore." The point is that the Reed Wilderness Seashore, extended far beyond the immediate vicinity of 8MT13. Assuming that this is the bone to which Carr et al. (1995) refer, its later placement as having come from 8MT13 is problematic. Assuming that it did come from the site, the context is unclear and its association with the shell ring builders is unknown. Other shell rings that the authors have worked on or are currently working on have yielded burials and/or isolated human bones that were intrusive (Russo 1991), or human bones have been found along eroding shores that were associated with an adjacent site, not the shell ring (Newman 2002).

We agree that human remains should always be considered when investigating and modeling shell ring functions. In general, however, shell rings are renowned for their absence or paucity of human remains. As such, we hesitate to suggest that 8MT13 may be a burial site, although discovering that it was, would not necessarily alter our main hypothesis that the ring served as a place of small and large-scale feasting in ceremonial contexts. Shell middens serving as places of both burial and disposition of shell remains are common among Archaic shell consuming cultures of the New World (Gaspar 1998; Goggin 1952).

[6]All dates and date ranges in the following section are from the cited references. Few of these references identify whether the dates, particularly those used to base ceramic chronologies on, were uncorrected, corrected (conventional), or calibrated dates.

The reader is advised that corrected radiocarbon ages from shell and those from charcoal are not directly comparable. Most of the dates upon which the local chronologies cited herein have been based were probably derived from charcoal assays. Comparison of radiocarbon dates from shell to these chronologies thus is problematic, not only for this article, but for archaeologists in general. We do not purport to have solved this problem. We have, however, provided calibrated dates from Joseph Reed (Table 1) and selected other sites mention in the text. When comparing charcoal and shell dates, calibrated ranges are best used, although conventional ages may be useful for illustrative purposes.

The intent of this section is to demonstrate that pottery from Joseph Reed is, indeed, earlier than most other secure dates proposed for the earliest Glades and other non-fiber-tempered pottery in the region. To that end, we included in Table 1 a calibration of the most commonly cited date for the earliest Glades pottery and beginning of Glades I period (e.g., Carr and Beriault 1984:6; Sears 1982; Widmer 1974;1988:75). Widmer (1988:75) cites the date of 450 +/-105 B.C. identified in Sears (1982:116) as uncorrected. Converting this to 2400 B.P. for calibration purposes, a calibrated intercept of 2357 B.P. is obtained, an intercept considerably younger than other sand-tempered ceramic associated dates in Table 1.

[7]Widmer's chronology for Southwest Florida is included here for heuristic purposes (Figure 11). It is important to note that Widmer (1988:71) dismissed the early date from 8CR112 of 4965 +/-100 as "too early" for ceramics at the site. We cannot determine from written reports (Widmer 1974; 1988) exactly what the association of the charcoal was with the ceramics found at the site. We advise readers to seek the original sources Widmer based his chronology on to render their own assessments of the validity of the dates (cf. Griffin 1988:132; Heide 2000).

Since the development of Widmer's chronology, two large shell ring sites, Bonita Bay (Houck 1996) and Horr's Island (Russo 1991) have yielded radiocarbon dated material that suggests that major sites

in the region before 4000 B.P. lacked ceramics. Widmer (1988:65, 71) knew of the aceramic aspect of Horr's Island at circa 4000 B.P., yet he proposed ceramic traditions extending to at least 4500 B.P. and possibly further back as early as 5000 B.P. (cf. Widmer 1988:58, 69). He mitigates this apparent contradiction by noting that some Late Archaic sites in South Florida seem to lack ceramics (Widmer 1988:68) (but does not offer suggestions as to the cause of this phenomenon). We note that despite his variable chronologies for pre-4000 B.P. pottery in South Florida, the earliest date for pottery from the region that he accepts as valid is only 3500 B.P. (Widmer 1988:72). Problems of consistency, however, should not detract from Widmer's major contribution: recognition of the early arrival of pottery in South Florida. The chronology presented in Figure 11, is one variant of Widmer's attempts.

[8]Transegalitarian is a catch-all term. Clark and Blake (1994) used the term to define "emergent chiefdoms," but we prefer the wider application "those between chiefdoms and true egalitarian societies" used by Hayden (2001:44). This use overcomes the teleological assumptions in "trans" suggestive that the societies are somehow "trans-"itioning or "trans-"forming into chiefdoms. Evolutionarily this may happen, but we do not suggest that is the case at Joseph Reed. We see transegalitarian formations as exhibiting evidence of social ranking, status, or power on a permanent or situational basis beyond those hypothesized for pure egalitarian societies, but exhibiting limited or no evidence of institutionalized, hierarchical ranking on a regional scale. Under this definition, simple chiefdoms or big men societies may be included, but not politically stratified chiefdoms with fixed social classes and hierarchical settlement patterns (Hayden 1995b:28). We could have used other terms to describe the social formation we envision at Joseph Reed. Perhaps equally useable under select circumstances are such terms as incipient, intermediate, or emergent complex societies or heterarchical or sequential hierarchical formations (Arnold 1996; Clark and Blake 1994; Ehrenreich et al. 1995; Hayden 1995b; Johnson 1982).

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In the summer of 1999, members of the Southeast Florida Archaeological Society, students and faculty from Florida Atlantic University, and staff from the National Park Service's Southeast Archeological Center in cooperation with the Hobe Sound National Wildlife Refuge conducted a three day investigation at the Refuge's Joseph Reed Shell Ring, the results of which are reported in this article. The authors wish to thank all these folks for their selfless contributions, in particular Sonja Gray and Joanne Talley, who made for us some valuable connections. In addition, we would like to thank Ann Cordell, Vicki Rolland, and Rebecca Saunders for their analyses and discussions with us of the ceramics from the site. Harry Iceland helped greatly in the field and took on the added responsibility of identifying the lithics from the site. Jerry Kennedy, Skye Wheeler, Ryan Wheeler, and Jim Pepe made available hard-to-get reports that provided the basis for our chronological interpretations. They are, of course, not to be held accountable for any heresies we've produced, but are thanked for doing ground-breaking work in a poorly known region. Their discoveries are widely cited and helped us interpret our puzzles. Funding was on a shoestring, and we'd like to thank Southeast Archeological Center, the Fish and Wildlife Service, the Louisiana State University Museum of Natural Science, and Lynn Shreve for their contributions.

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